



POLICE DEPARTMENT
CITY OF BURLINGTON

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MEMORANDUM

To: Burlington City Council
Fr: Eric Fowler, Crime Analyst
Re: North Avenue Crash & Injury Data
June 28, 2017

Our department was asked to update an analysis of crash and injury data related to the North Avenue Pilot Project originally reviewed in October of 2016. This memorandum provides a summary of our work and findings.

Overview of Crash Data Compilation:

- Gathering the data to perform the following analyses was a multiple-step process.
 1. I extracted data from the BPD's record management system on all car crash incidents the department responded to in the city of Burlington occurring within four study control periods, specifically from July 1 through June 26 during the years 2012/2013, 2013/2014, 2014/2015 and 2015/2016, and occurring within the experimental or intervention period, specifically from July 1, 2016 through June 26, 2017. The period 7/1/2016 to 6/26/2017 is the period infrastructural changes took effect on North Avenue pursuant to the Pilot Project. Comparing this period to the same months during the four previous control periods allows for a standardized, equitable evaluation. This made up the city-wide crash sample.
 2. From this sample, I extracted all crashes that occurred in North Avenue Area A (Washington St to Plattsburg Ave) using the street address connected to the incident.
 - a. I then manually vetted each incident file individually, examining the incident narrative as well as a scanned copy of the police report or ticket, to determine if the crash took place on a public area of the North Avenue Area A stretch or if it occurred in an adjacent parking lot or driveway. Incidents that occurred in these private areas were marked as such.
 - b. I also used this process to ascertain the type of crash that occurred and whether or not there were injuries.
 3. From this scrubbed sample I created a subset for North Avenue Area B (Route 127 to Shore Rd) using the street address connected to the incident.
 4. From here, I performed simple analyses on each sample to produce raw counts of crashes city-wide, on North Ave A, and on North Ave B as well as raw counts of crash types and crashes involving injuries for North Ave A and North Ave B.
 5. Below, I present analyses comparing these counts across years.



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Summary of Crash Data:

Crashes and Types by Study Period (7/1-6/26)

	'12-'13	'13-'14	'14-'15	'15-'16	'16-'17	Change from Avg
Citywide	1499	1634	1519	1350	1504	0%
North Ave A	52	59	52	52	40	-26%
Type of Crash						
Animal	2	1	0	1	1	0%
Backing Into	3	1	4	1	3	+33%
Broadside	15	16	7	11	7	-43%
Head On	2	4	6	2	1	-71%
Pedestrian	0	1	2	2	1	-20%
Rear End	11	16	16	16	16	+8%
Roadside Obst	9	5	5	5	2	-67%
Sideswipe	9	12	11	11	6	-44%
Other/Unknown	1	3	1	3	3	+50%
North Ave B (subset of A)	31	31	30	28	22	-27%
Type of Crash						
Animal	1	1	0	0	1	+100%
Backing Into	3	1	1	0	2	+60%
Broadside	10	7	4	7	4	-43%
Head On	1	3	5	1	0	N/A
Pedestrian	0	1	2	1	0	N/A
Rear End	5	6	9	9	10	+38%
Roadside Obst	4	1	2	2	1	-56%
Sideswipe	7	8	6	8	4	-45%
Other/Unknown	0	3	1	0	0	N/A



Crashes Involving Injuries by Study Period (7/1 - 6/26)

	12-'13	'13-'14	'14-'15	'15-'16	'16-'17	Change from Avg
Citywide Total Crashes	1499	1634	1519	1350	1504	0%
Involving Injury	117	93	82	110	98	-2%
North Ave A Total Crashes	52	59	52	52	40	-26%
Involving Injury	9	10	10	18	6	-49
North Ave B (subset of A) Total Crashes	31	31	30	28	22	-27%
Involving Injury	6	6	6	12	2	-73%

Crashes on Route 127 by Study Period (7/1 - 6/26)

	'12-'13	'13-'14	'14-'15	'15-'16	'16-'17	Change from Avg
Citywide	1499	1634	1519	1350	1504	0%
North Ave A	52	59	52	52	40	-26%
North Ave B (subset of A)	31	31	30	28	22	-27%
Route 127 (BPD Data)	26	29	36	34	26	-17%
Route 127 (VTrans Data)	20	15	16	16	16	-4%



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Analysis:

- Crashes city-wide during the intervention period were equal to the control period average but down considerably in both North Ave segments (-26% and -27%).
- Injuries city-wide during the intervention period were down slightly (-2%) but were down considerably in both North Avenue segments (-49% and -73%) indicating that crashes during the intervention period in North Ave A and B were not only fewer in number, but also less severe.
- The only meaningful exception to the overall decrease in crashes was for rear-end collision crashes, which increased 8% and 38% in the North Ave A and B respectively and make up the most common category of crash in the entire sample.
- It is also important to note the change in crash volumes in the areas we determined to be private parking lots or driveways adjacent to North Avenue and on intersecting roads away from the intersection. If the Pilot Project were achieving its intended effect (i.e. reducing crashes in the intervention area of North Avenue), we would expect to see a reduction in the volume of crashes in the public areas inside the intervention stretch and in areas immediately adjacent to it but no such decrease in the parking lots, driveways and intersecting streets that are adjacent to North Avenue but not affected by its traffic patterns and flow. Observing a reduction in crashes in those areas adjacent to North Ave but not immediately on North Ave that mirrored the reduction in crashes on North Ave could imply that an exogenous factor is causing an overall reduction in crashes or the reporting of crashes in that area of the city (e.g. people less likely to report crashes in that area, police with slower response times to crashes in that area leading to cancelled calls, etc). This would indicate the relationship between the Pilot Project itself and the reduction in crashes on North Ave was spurious. A quick analysis reveals that crashes in private areas and areas adjacent to, but not on, North Avenue did decrease in both the North Ave A and North Ave B sections (-6% and -11% respectively - see map below), however, those decreases are not nearly as pronounced as the decreases in the public areas of North Ave (-26% and -27% respectively), indicating a unique affect to the North Avenue corridor caused by the Pilot Project.
- Related, using the same rationale, I analyzed the change in crashes on North Avenue in sections not affected by the Pilot Project Intervention (i.e. the stretch north of Plattsburg Ave and the stretch south of Washington St). Without knowing which incidents occurred in private versus public areas of these stretches, it was clear that overall there was not a decrease in crashes that mirrored the decrease in North Ave sections A and B. Specifically, in these areas of North Ave unaffected by the Pilot Project, there was an 8% decrease in crashes (see map below).
- Finally, there is a potential that the observed decrease in crashes on North Avenue could simply be the product of lower traffic volumes if drivers are avoiding the roadway altogether and instead taking the adjacent Route 127 (Beltline). A shift in traffic patterns pushing traffic from North Avenue to Route 127 could result in a displacement of car crashes to the Beltline. If this were true, we would expect to



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observe a higher number of crashes on the Beltline during the intervention period in 2016 and 2017 as compared to the same period in years prior. However, analyzing car crash incidents on the Beltline both from internal BPD records and from the Vermont Agency of Transportation shows small decreases in car crashes on the Beltline during the 2016-'17 period as compared to the average. The decrease is not as large in magnitude as the decrease in North Ave A or B, offering further evidence that the decrease in crashes in the bike lane area was unique to that specific stretch and cannot be explained fully by a more general regional decrease in crashes. This finding also offers evidence that any potential displacement of traffic from North Ave to Route 127 did not result a measureable increase in crashes on Route 127.

- Because of the small sample size and short duration of the pilot project, it is not possible to conclude to a degree of statistical significance that the intervention itself is the cause, and the only cause, of the reductions in crashes in the intervention areas.
- Additionally, because of the very small sample size and the short duration, it is not possible to conclude the intervention had an effect on crashes involving injuries.



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**Map Depicting Change in Volume of Crashes During the Pilot Project Intervention
Period on North Avenue by Road Segment**

